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(54) Abstract Title  
**Attachment device for a safety line**

(57) A demountable attachment device is provided for slidably securing a safety line (4) to a generally horizontal lifeline cable (6) or the like provided on a structure (8). The device comprises first and second components (10 and 12, respectively) secured for relative rotation about an axis of rotation (16) and for relative displacement along the axis of rotation (16).

The first and second components (10 and 12) have cooperating jaw-like portions (18 and 20, respectively) for providing sliding engagement with the cable (6) and cooperating apertured portions (22 and 24, respectively) for receiving an attachment hook (30) associated with the safety line (4).

Means (32, 34) is provided to permit relative rotation between the first and second components (10 and 12) in a first position of relative displacement along the axis to allow separation of the jaw-like portions for engagement with, or disengagement from, the cable (6), and to prevent relative rotation in a second position of relative displacement along the axis.

Locking means (26, 28, 30) is also provided to prevent relative displacement of the first and second components from the said second position.

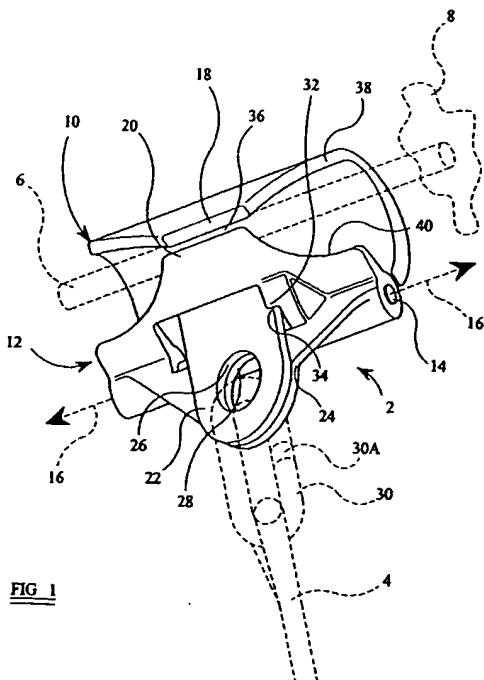


FIG 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.  
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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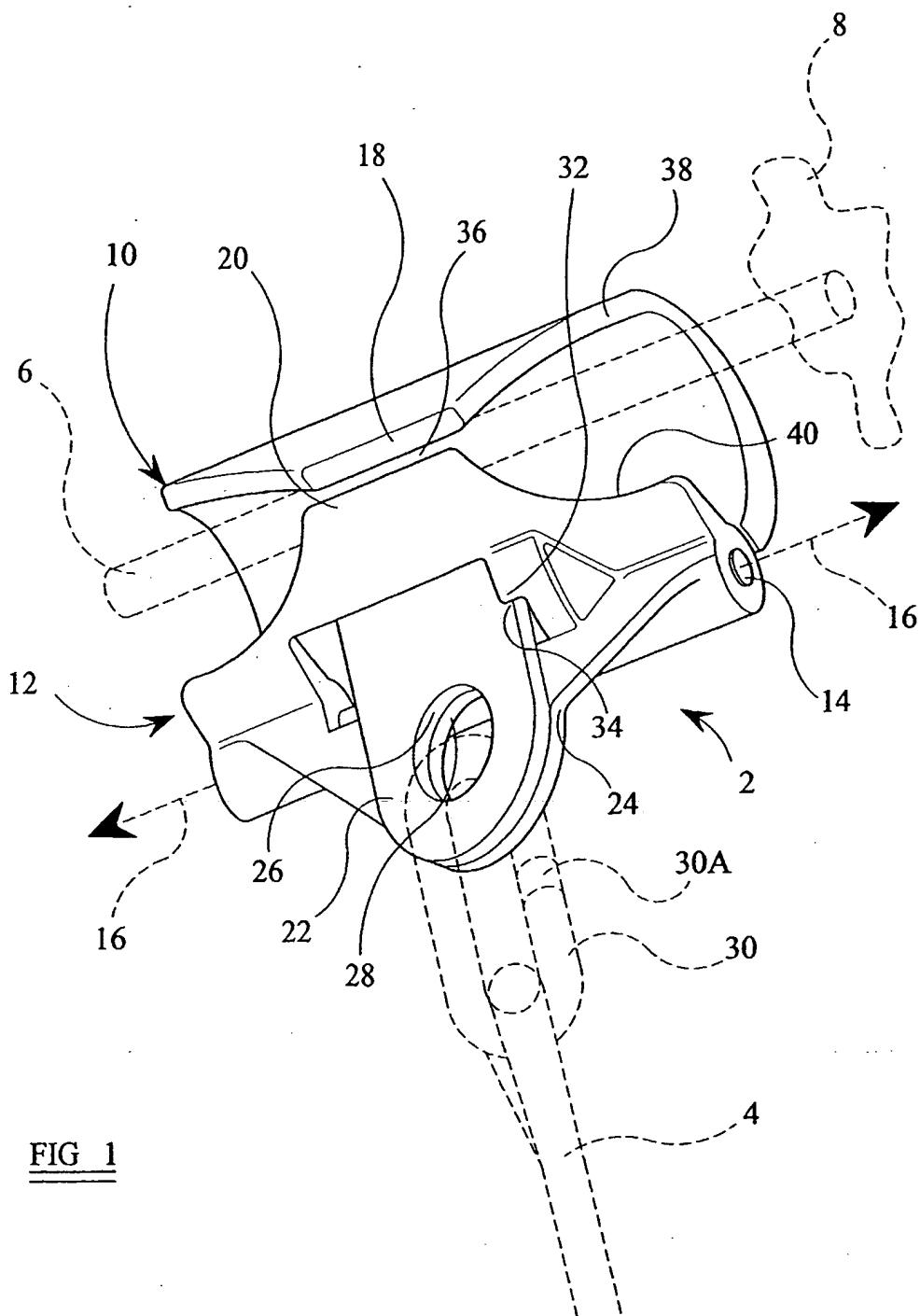


FIG 1

17 10 01

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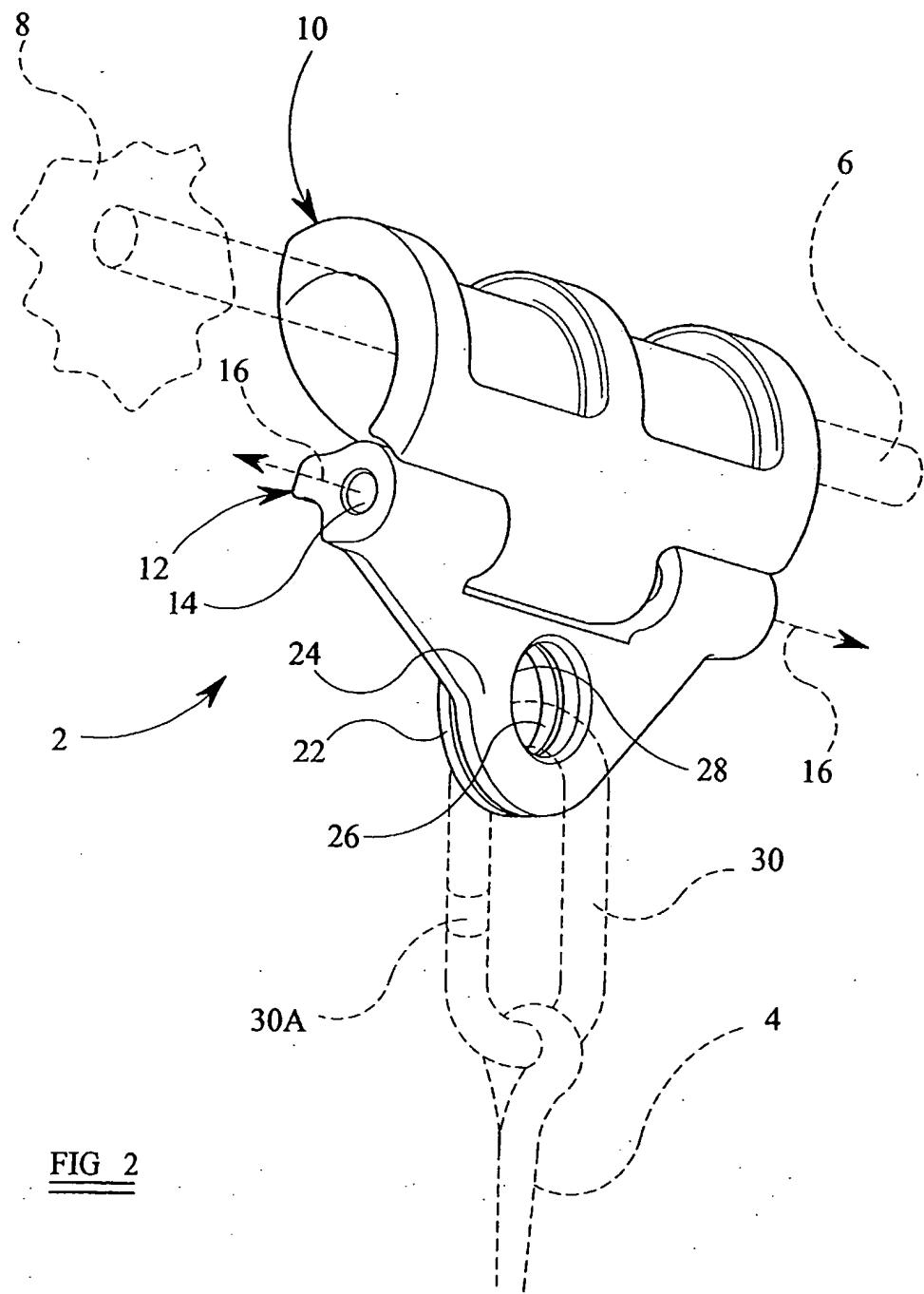


FIG 2

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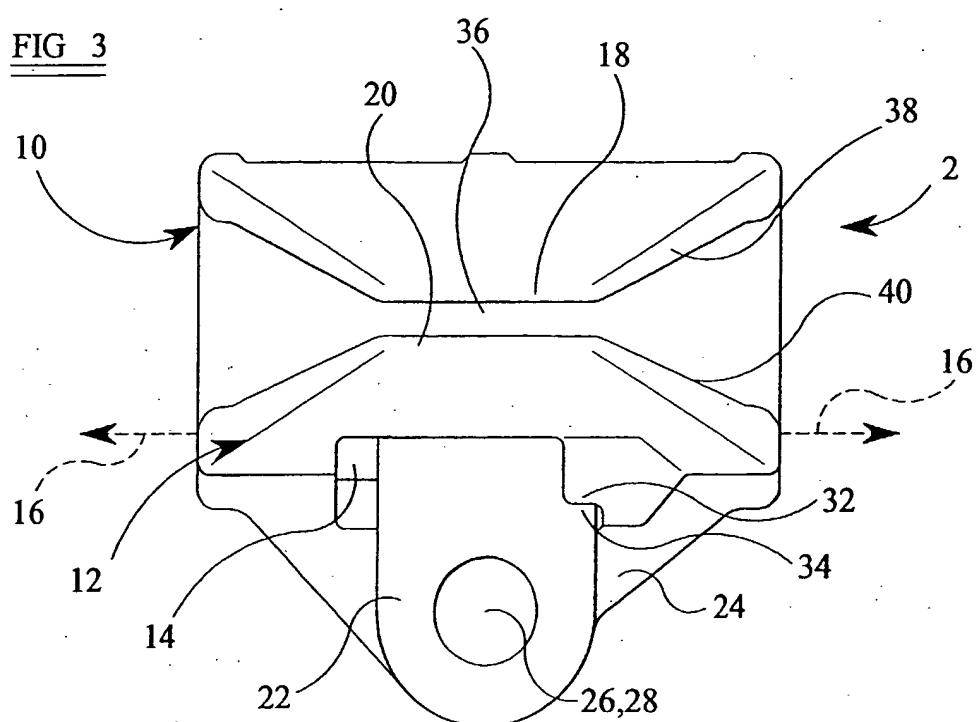
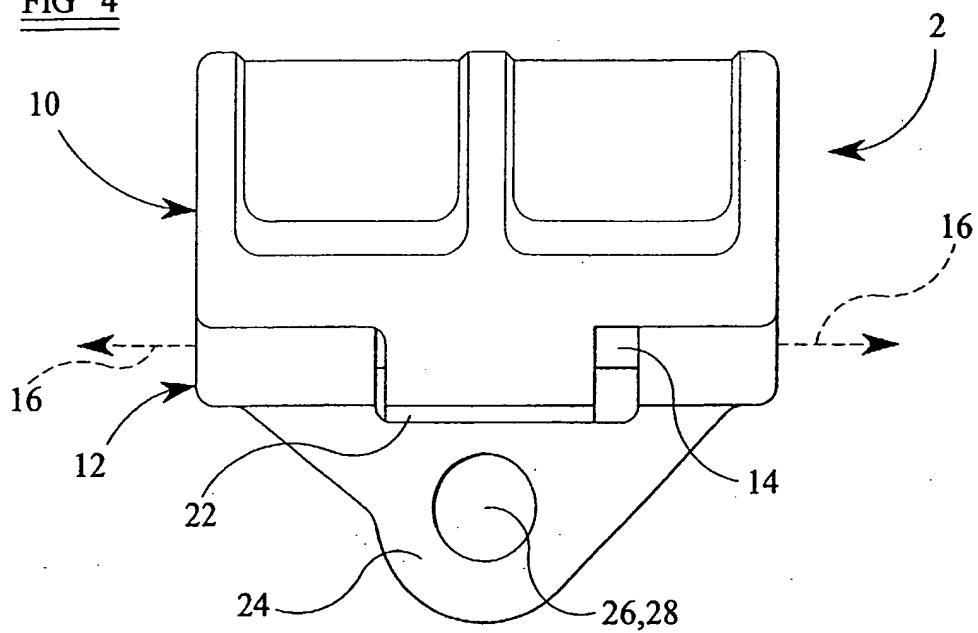
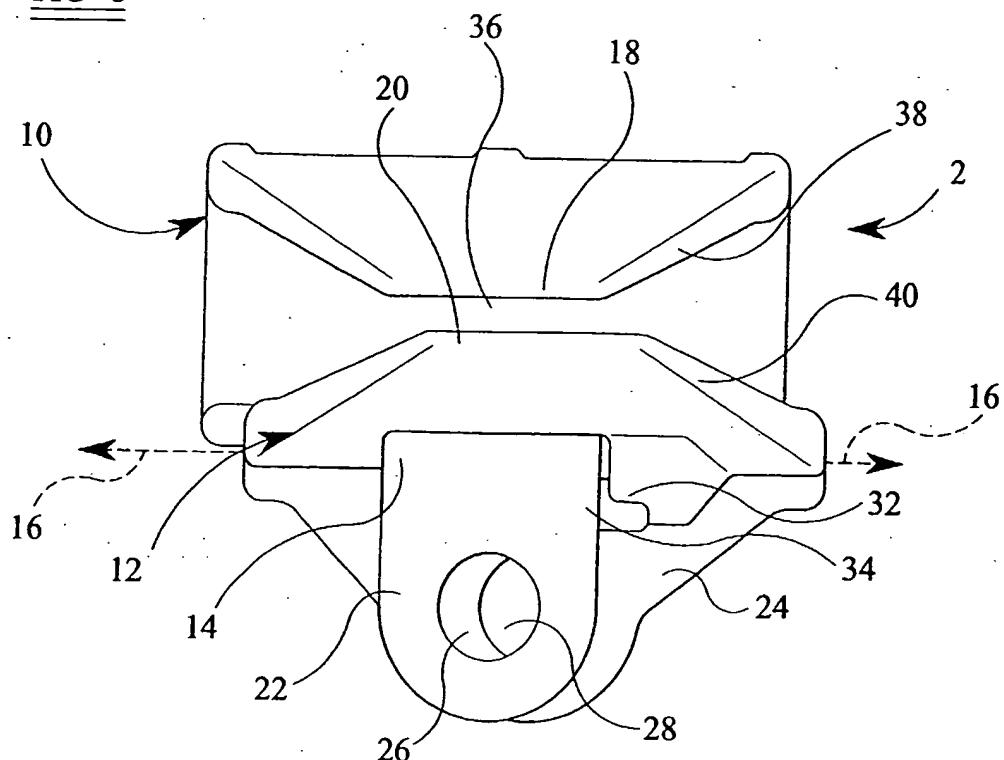
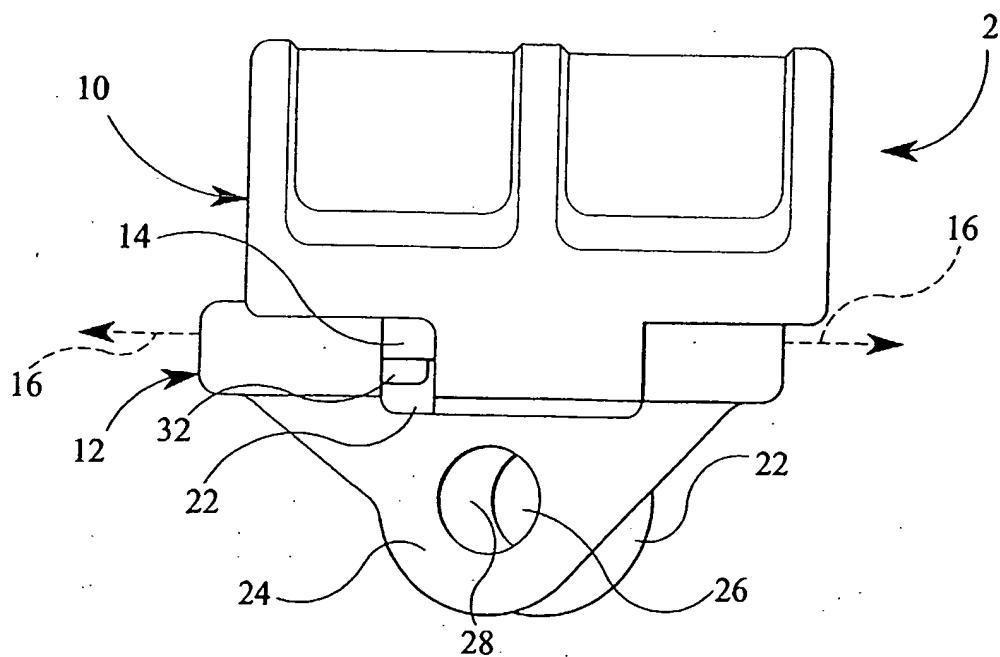
FIG 3FIG 4

FIG 5FIG 6

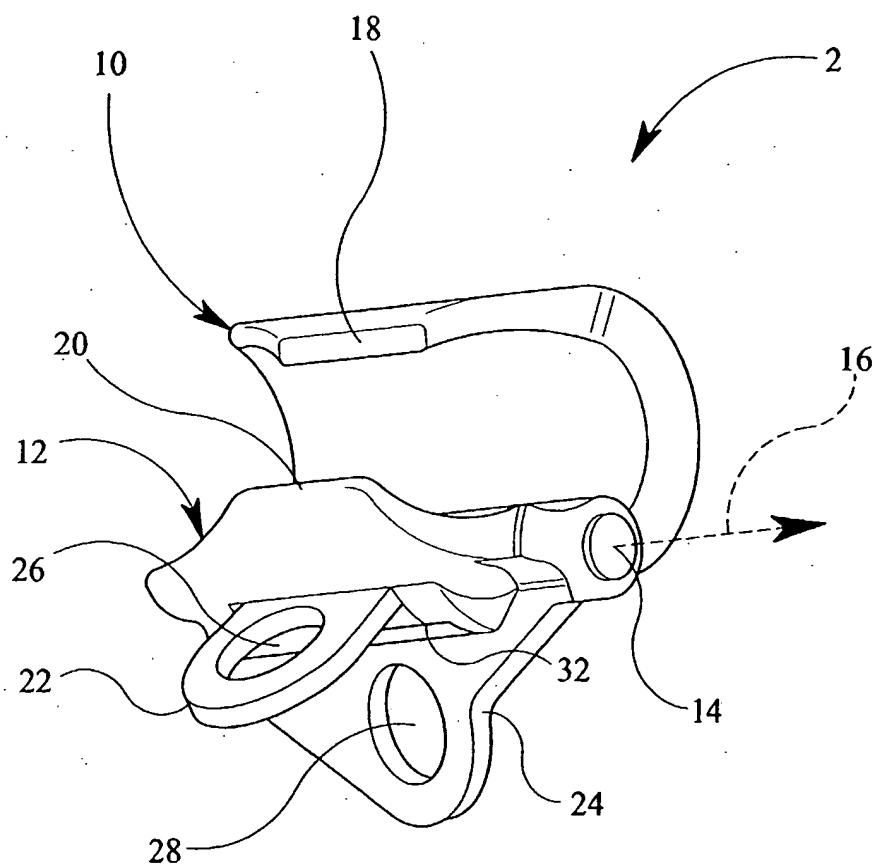


FIG 7

## ATTACHMENT DEVICE FOR A SAFETY LINE

The present invention relates to an attachment device for a safety line, and more particularly to an attachment device for slidably securing a safety line to a generally horizontal lifeline cable provided on a structure, such as a building.

Horizontal lifeline cable systems are known in which a cable is secured generally horizontally to a structure, such as a building, at a high level thereof and arranged to provide protection against falling for people working on the structure. Such people wear a harness to which one end of a safety line is secured, the other end being slidably secured, by means of an attachment device, to the horizontal lifeline cable.

The attachment device must be reliably secured to the horizontal lifeline cable and must be capable of sliding along the cable to follow movement of a person whose safety line is attached thereto.

It is known to provide an attachment device which is demountable on the cable and which incorporates a latching arrangement to prevent accidental removal or dislodging of the device from the cable, which latching

arrangement relies solely on a hook, such as a karabiner hook, connecting a safety line thereto, for its security.

It is an object of the present invention to provide an  
5 attachment device which is demountable on a generally horizontal lifeline cable and which incorporates one or more improved safety features.

According to the present invention there is provided a  
10 demountable attachment device suitable for slidably securing a safety line to a generally horizontal lifeline cable or the like provided on a structure, the device comprising: first and second components secured for relative rotation about an axis of rotation and for  
15 relative displacement along the axis of rotation, the first and second components having cooperating jaw-like portions for providing sliding engagement with the cable, and cooperating apertured portions for receiving an attachment hook associated with the safety line; means to  
20 permit relative rotation between the first and second components in a first position of relative displacement thereof, to effect separation of the jaw-like portions for engagement with, or disengagement from, the cable or the like, and to prevent relative rotation between the  
25 first and second components in a second position of relative displacement thereof, to prevent separation of

the jaw-like portions; and locking means operable to prevent relative displacement of the first and second components from the second position of relative displacement to the first position of relative  
5 displacement.

The cooperating apertured portions of the first and second components may each be of flange-like form.

10 The means to permit relative rotation between the first and second components in the first position of relative displacement thereof and to prevent relative rotation between the first and second components in the second position of relative displacement thereof may comprise  
15 cooperating regions of the first and second components, which regions engage one another in the second position of relative displacement, to prevent relative rotation between the first and second components, and disengage one another in the first position of relative  
20 displacement, to permit relative rotation between the first and second components.

The locking means operable to prevent relative displacement of the first and second components from the  
25 second position of relative displacement to the first position of relative displacement may comprise the

attachment hook associated with the safety line, the attachment hook passing through aligned apertures in the apertured portions of the first and second components, such apertures being in alignment only in the second

5 position of relative displacement of the first and second components.

The attachment hook associated with the safety line may be a latchable or lockable hook and may be a karabiner

10 hook.

The safety line may be adapted and arranged for securing to a person to be protected from falling.

15 The cooperating jaw-like portions may be adapted and arranged whereby when in an unseparated position in engagement with the cable, a gap exists therebetween having a width which is sufficient to permit the attachment device to traverse a support bracket for the

20 cable but insufficient to permit passage therethrough of the cable. The cooperating jaw-like portions may be profiled near the region of the gap therebetween whereby automatic alignment with the support bracket for traversal thereof is effected.

The first and second components may be mounted on a pin, such as of stainless steel, the pin forming the axis of rotation about which the relative rotation of the first and second components is effected and along which the  
5 relative displacement of the first and second components is effected.

The first and second components may be of cast form and may comprise stainless steel.

10

The generally horizontal lifeline cable may comprise stainless steel wires or a bundle of synthetic plastics fibres, such as polyester fibres, which may be enclosed in a jacket, such as of neoprene.

15

The structure may be a building.

The attachment device of the invention provides very secure and reliable slidable attachment, to a generally  
20 horizontal lifeline cable or the like, of a safety line secured to a person working at a high level on a structure, such as a building. The first and second components of the device are relatively displaced along the axis of rotation into the first position of  
25 displacement. This allows relative rotation of the jaw-like portions such that they can be separated, located

around the cable, then brought together again. The first and second components are then relatively displaced along the axis of rotation into the second position of displacement where they are prevented from relative 5 rotation. The jaw-like portions are therefore prevented from being separated in this position. In this position the apertures in the apertured portions of the first and second components come into alignment, permitting the attachment hook, associated with the safety line from the 10 person, to be secured through them and preventing further relative displacement between the first and second components along the axis of rotation. The process is reversed when it is required to remove the attachment device from the cable or the like.

15

For a better understanding of the invention and to show more clearly how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

20

Figure 1 is a perspective view from a first side of an embodiment of an attachment device according to the present invention;

25 Figure 2 is a perspective view from a second side of the attachment device of Figure 1;

Figure 3 is a view from a first side of the attachment device of Figure 1 with first and second components thereof secured against relative rotation;

5 Figure 4 is a view from a second side of the attachment device of Figure 3;

Figure 5 is a view from a first side of the attachment device of Figure 1 with first and second components  
10 thereof arranged for relative rotation;

Figure 6 is a view from a second side of the attachment device of Figure 5; and

15 Figure 7 is a perspective view of the attachment device of Figure 1 showing separated jaw-like portions of first and second components thereof.

Referring to Figures 1 and 2, an attachment device 2 is  
20 provided for slidably securing a safety line 4 to a generally horizontal lifeline cable 6 provided on a structure 8, such as a building. The safety line 4 is arranged to be secured to a person (not shown) who is to be protected from falling from the structure 8.

The attachment device 2 comprises first and second components 10, 12 which are secured for sliding and rotating on a pin 14, suitably of stainless steel, and are arranged for relative rotation about an axis of 5 rotation 16 and for displacement relative to one another along the axis of rotation 16.

The first and second components 10, 12 suitably comprise stainless steel castings and have cooperating jaw-like 10 portions 18, 20 for encircling, and providing sliding engagement with, the cable 6.

The cable 6 may comprise stainless steel wires. However the cable 6 may advantageously comprise a bundle of 15 synthetic plastics fibres, such as polyester fibres, which may be enclosed in a jacket, such as of neoprene.

The first and second components 10, 12 also have cooperating flange-like portions 22, 24 having apertures 20 26, 28. These apertures 26, 28 are alignable to receive an attachment hook 30, such as a karabiner hook, for securing the safety line 4 to the attachment device 2.

The hook 30 incorporates a locking means 30A.

25 When the first and second components 10, 12 are in a position of sliding displacement relative to each other

along the pin 14 as shown in Figures 1 and 2 and also shown in Figures 3 and 4, relative rotation between the first and second components 10, 12 is prevented by engagement of a stepped region 32 of the second component 5 12 with a region 34 of the first component 10. In this position the jaw-like portions 18, 20 cannot be separated and the attachment device 2 is therefore securely engaged with the cable 6 and can be slid along the cable 6 as required. Removal of the attachment device 2 from the 10 cable requires relative lateral displacement of the components 10, 12 along the axis of rotation 16, in order to disengage the regions 32 and 34 from one another and permit relative rotation of the components 10, 12 to separate the jaw-like portions 18, 20. This is not 15 possible while the attachment hook 30 is secured through the aligned apertures 26, 28.

Referring now to Figures 5 and 6, the attachment hook 30 has been removed from the aligned apertures 26, 28 and 20 the first and second components 10, 12 have been displaced relative to one another along the axis of rotation 16 thereby disengaging the regions 32 and 34 from one another. It will be noted that in this position it is not possible to insert the attachment hook 30 25 (Figure 1) through the apertures 26, 28 because of the misalignment thereof.

As shown in Figure 7, the first and second components 10, 12 can now be rotated relative to one another on the pin 14, about the axis of rotation 16, to effect separation of the jaw-like portions 18, 20. This permits the 5 attachment device 2 to be removed from, or fitted to, the cable 6 (shown in Figures 1 and 2).

For fitting the attachment device 2 to the cable 6 and for removing of the attachment device 2 from the cable 6 10 the attachment hook 30 must therefore always be removed from its location through the apertures 26, 28. Once removed, the first and second components 10, 12 can be relatively displaced along the axis of rotation 16 to disengage the regions 32 and 34 from one another and 15 permit relative rotation of the components 10, 12 to separate the jaw-like portions 18, 20 and allow the attachment device 2 to be fitted to, or removed from, the cable 6.

20 In the case of fitting of the attachment device to the cable 6, the first and second components 10, 12 are then rotated relative to one another to close the jaw-like portions 18, 20 around the cable 6. The components 10, 12 are then displaced relative to one another along the 25 axis of rotation 16 until the regions 32, 34 come into engagement and the apertures 26, 28 come into alignment.

The attachment hook 30 is then secured through the apertures 26, 28 to effect locking of the attachment device 2.

5 It is arranged that when the attachment device 2 is slidably secured to the cable 6, as shown in Figure 1, a gap 36 remains between the jaw-like portions 18, 20. This gap is much smaller in width than the diameter of the cable 6 but is of sufficient width to permit the  
10 attachment device 2 to traverse a support bracket (not shown) which may be provided for the cable 6. The jaw-like portions 18, 20 may also have profiles 38, 40 near the region of the gap 36 whereby the attachment device 2 automatically aligns itself with such a support bracket  
15 for traversal thereof.

CLAIMS

1. A demountable attachment device suitable for  
slidably securing a safety line to a generally horizontal  
5 lifeline cable or the like provided on a structure, the  
device comprising: first and second components secured  
for relative rotation about an axis of rotation and for  
relative displacement along the axis of rotation, the  
first and second components having cooperating jaw-like  
10 portions for providing sliding engagement with the cable,  
and cooperating apertured portions for receiving an  
attachment hook associated with the safety line; means to  
permit relative rotation between the first and second  
components in a first position of relative displacement  
15 thereof, to effect separation of the jaw-like portions  
for engagement with, or disengagement from, the cable or  
the like, and to prevent relative rotation between the  
first and second components in a second position of  
relative displacement thereof, to prevent separation of  
20 the jaw-like portions; and locking means operable to  
prevent relative displacement of the first and second  
components from the second position of relative  
displacement to the first position of relative  
displacement.

2. An attachment device as claimed in claim 1, wherein  
the cooperating apertured portions of the first and  
second components are each of flange-like form.

5 3. An attachment device as claimed in claim 1 or 2,  
wherein the means to permit relative rotation between the  
first and second components in the first position of  
relative displacement thereof and to prevent relative  
rotation between the first and second components in the  
10 second position of relative displacement thereof  
comprises cooperating regions of the first and second  
components, which regions engage one another in the  
second position of relative displacement, to prevent  
relative rotation between the first and second  
15 components, and disengage one another in the first  
position of relative displacement, to permit relative  
rotation between the first and second components.

4. An attachment device as claimed in any preceding  
20 claim, wherein the locking means operable to prevent  
relative displacement of the first and second components  
from the second position of relative displacement to the  
first position of relative displacement comprises the  
attachment hook associated with the safety line, the  
25 attachment hook passing through aligned apertures in the  
apertured portions of the first and second components,

such apertures being in alignment only in the second position of relative displacement of the first and second components.

5 5. An attachment device as claimed in any preceding claim, wherein the attachment hook associated with the safety line is a latchable or lockable hook.

6. An attachment device as claimed in claim 5, wherein  
10 the attachment hook is a karabiner hook.

7. An attachment device as claimed in any preceding claim, wherein the cooperating jaw-like portions are adapted and arranged whereby, when in an unseparated  
15 position in engagement with the cable, a gap exists therebetween having a width which is sufficient to permit the attachment device to traverse a support bracket for the cable but insufficient to permit passage therethrough of the cable.

20

8. An attachment device as claimed in claim 7, wherein the cooperating jaw-like portions are profiled near the region of the gap therebetween whereby automatic  
25 alignment with the support bracket for traversal thereof is effected.

9. An attachment device as claimed in any preceding  
claim, wherein the first and second components are  
mounted on a pin, the pin forming the axis of rotation  
about which the relative rotation of the first and second  
5 components is effected and along which the relative  
displacement of the first and second components is  
effected.

10. An attachment device as claimed in any preceding  
10 claim, wherein the first and second components are of  
cast form.

11. A demountable attachment device substantially as  
hereinbefore described with reference to, and as shown  
15 in, the accompanying drawings.



Application No: GB 0029042.9  
Claims searched: 1-10

Examiner: Philip Silvie  
Date of search: 18 April 2002

## Patents Act 1977

### Search Report under Section 17

#### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): E2A (AHD)

Int Cl (Ed.7): A62B (35/00, 35/04); F16B 45/02, 45/06)

Other: Online: WPI, EPODOC, JAPIO

#### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	NONE	

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.